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Project name:
The Credit Woodlands Study

Project ref:
60734034

From:
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Date:
September 16, 2024

Memo

Subject: Feasibility Assessment of Reinstating the Original Intersection Configuration

This memo outlines the initial findings of an assessment of the original one-way rotary configuration surrounding Bert Fleming Park in the Erindale Woodlands Neighbourhood, Mississauga.

Since its installation in the 1950's, this one-way rotary has facilitated quick and easy vehicle movements without having the requirement to stop. As shown in **Figure 1**, the road network was originally designed connecting The Credit Woodlands, a minor collector[1] road that runs between Dundas Street West and Burnhamthorpe Road West, with Credit Heights Drive and McBride Avenue.

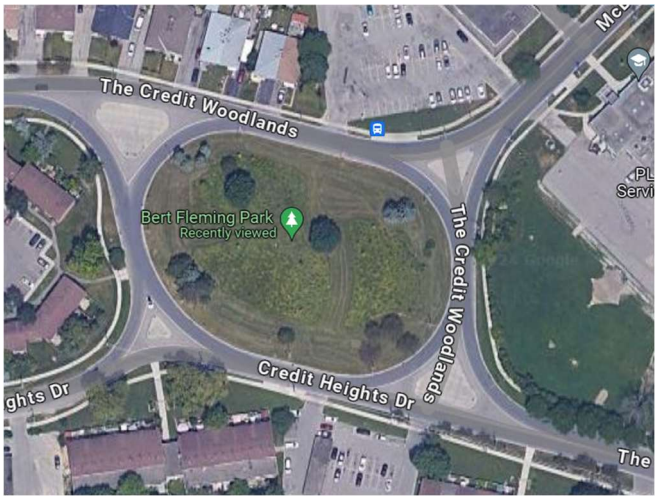

Figure 1: Aerial view of the original configuration of The Credit Woodlands Traffic Circle

This configuration operated as a circular intersection designed to manage traffic flow where vehicles travel counterclockwise around the central island (referred to as "circulating traffic"), entering and exiting the rotary at one of four points (referred to as either the northwest, southwest, southeast or northwest quadrant). A plan view of the original design[2] confirmed that initially The Credit Woodlands

[1] The Credit Woodlands is designated as a minor collector road as shown in the City's Official Plan, Schedule 5 – Long Term Road Network.
[2] Design provided by the City for AECOM's reference by email on August 28, 2024.

roadway operated without any yield control for entering the rotary, and circulating traffic would have to yield to traffic entering from the northwest or the southeast from The Credit Woodlands. However, in the southwest and northeast quadrants, vehicles entering from McBride Avenue and Credit Heights Drive would yield to circulating traffic.

The traffic operations of the original rotary were revised on two occasions. Sometime between 1965 and 2022, the yield-conditions were changed in the southeast quadrant requiring traffic entering from The Credit Woodlands to yield to circulating traffic. It appears that a similar change was made in the northwest quadrant in 2022. The reason for these operational changes and why they were potentially introduced at different times is not known, but it is presumed the changes were made in an attempt to more closely resemble traffic operations of a roundabout.

Following the temporary installation of the Tactical Urbanism initiative, also known as 'Sharing Lanes', which was installed in summer 2023, the City is now seeking a permanent intersection configuration through the Credit Woodlands Study ("study"). As part of the study, AECOM has conducted a high-level review related to the feasibility of reinstating the original traffic circle configuration. This review is divided into several sections, discussing policy/planning guidance, design guidelines, and road safety considerations, along with conclusions and recommendations.

1. City Policy and Planning Guidance

i. Official Plan (2024)

The Official Plan (OP) provides guidance on the City's road network and identifies that The Credit Woodlands roadway is a minor collector[3]. This means that the purpose of The Credit Woodlands roadway is "to accommodate low levels of traffic and to provide property access". The main objective of the Credit Woodlands does not include accommodating free-flow traffic (i.e., absence of stop- or yield-conditions). The OP defines minor collector and local roads as having the same purpose.

ii. Vision Zero Action Plan (2021)

The City of Mississauga is committed to its Vision Zero mission to provide a safe and equitable transportation network that protects all users, with specific emphasis on the most vulnerable users of the road like pedestrians and cyclists. This approach means that safety is prioritized over other factors such as cost, speed, delay, level of service and convenience. The geometry of the original design conflicts with the objectives of Vision Zero. While speed data is not available for review, the understanding is that the original configuration did allow for higher travel speeds.

iii. Transportation Master Plan (2021)

The original configuration gave primary importance to ensuring a free flow of motorized vehicular traffic along The Credit Woodlands during the time when the neighbourhood was starting to grow in size and density. It was also at a time when car production was at its peak after the Second World War, accompanied by the mass building of roads and multi-lane highways which allowed for increased speeds and more vehicles. The car in the 1950s was a symbol of social standing and level of affluence.

Fast forward to present day, the City's Transportation Master Plan (TMP) gives guidance on its objectives for multi-modal transportation. As noted in the TMP objectives "half of the trips to, from, and within Mississauga are taken by sustainable mode shares" by 2041. [4]

iv. Pedestrian Master Plan (2021)

The visible lack of controlled crossing facilities for pedestrians and cyclists shows that the original design provides a lower priority for vulnerable road users. Over time, the surrounding neighbourhood

[3] City of Mississauga, Official Plan, Schedule 5 – Long Term Road Network
[4] City of Mississauga Transportation Master Plan (2021), Chapter 5, page 83

has grown in size and density and there is seemingly more demand for walking and cycling facilities as both a healthy lifestyle and commuting means. This intersection was identified in the Pedestrian Master Plan as one of the "gaps" in the City's pedestrian network[5]. It is also identified as a priority location for implementing measures to bridge the network gap for pedestrians.[6]

v. Draft Complete Streets Guide (2024)

The original configuration conflicts with the City's draft Complete Streets Guide (Guide) which aims to provide a safe and comfortable environment for pedestrians of all ages, bicycles, transit users and people with disabilities. According to the Guide, The Credit Woodlands, which is classified as a Minor Collector Neighborhood Street, should have a high-quality pedestrian realm, street tree planting and multi-modal travel options. In contrast, the rotary offers free flow traffic conditions for motor vehicles, lacks designated pedestrian and cyclist crossing points, and diverges from the aims of this policy document.

vi. Cycling Master Plan (2018)

The Credit Woodlands corridor, between Burnhamthorpe Road West and Dundas Street W, has been identified as a cycling route in the City's Cycling Master Plan Five Year Implementation Plan due to its key role in providing the connection between the two major roads. This will allow integration with McBride Avenue, an existing cycling route, providing continuous north to south access and beyond to key destinations, transit and neighbourhoods. The geometry of the rotary and the lack of designated cycling facilities and crossing points conflict with the aims of the Cycling Master Plan to provide a comfortable, connected and convenient cycling network.

2. Design Guidelines

i. Road Classification

As a minor collector road, The Credit Woodlands, directs vehicles between the arterial and local road network. For example, from Burnhamthorpe Road West, the rotary surrounding Bert Fleming Park allows for southwest, southeast and northeast movements, which makes this intersection a key connection to access the existing neighbourhoods in these areas.

According to the Geometric Design Guide for Canadian Roads (the GDGCR) published by Transportation Association of Canada (TAC), a residential collector road in an urban environment is typified by traffic volumes of less than 8,000 vehicles per day, providing land access and traffic movement with equal importance with design speed of between 50 to 80 km/h and average off-peak running speeds (i.e., actual travel speeds) of 30 to 70 km/h. The GDGCR defines a local residential road as a road having traffic volumes of less than 1,000 vehicles per day with lower design and off-peak running speeds of 30 to 50 km/h and 20 to 40 km/h, respectively and its primary function is to provide access to properties.

As noted previously, the City's OP assigned the same purpose to both of their minor collector and local road classifications. Based on traffic volume data collected in November 2023, there are approximately 3,900[7][8] vehicles per day or less, which falls between the TAC roadway classifications of local and collector road. The number of driveways with direct access to The Credit Woodlands could mean that this roadway more closely resembles a local road as defined by TAC, which then matches the City's OP classification prioritizing property access and supporting lower travel speeds to avoid vehicle conflicts between road users and vehicles entering/exiting driveways.

[5] City of Mississauga, Pedestrian Master Plan (2021), Figure 7 – Pedestrian Network Gap.
[6] City of Mississauga, Pedestrian Master Plan (2021), Figure 10 – Pedestrian Network Map Priorities
[7] Average Annual Daily Traffic estimated based on ATR counts collected on November 7, 2023, and provided by the City for use in this assessment.
[8] In the September 11, 2024 version of this memo, the font of footnote reference "7" was inadvertently changed from superscript formatting to regular text formatting, making the number "3,900" look like "3,9007". This error has now been corrected.

ii. Property Access

Modifying the existing configuration to a roundabout that meets current design standards and guidelines by introducing horizontal deflection for speed control, will result in a minimum of 7 residential driveways impacted as shown below in the below concept sketch (**Figure 2**).

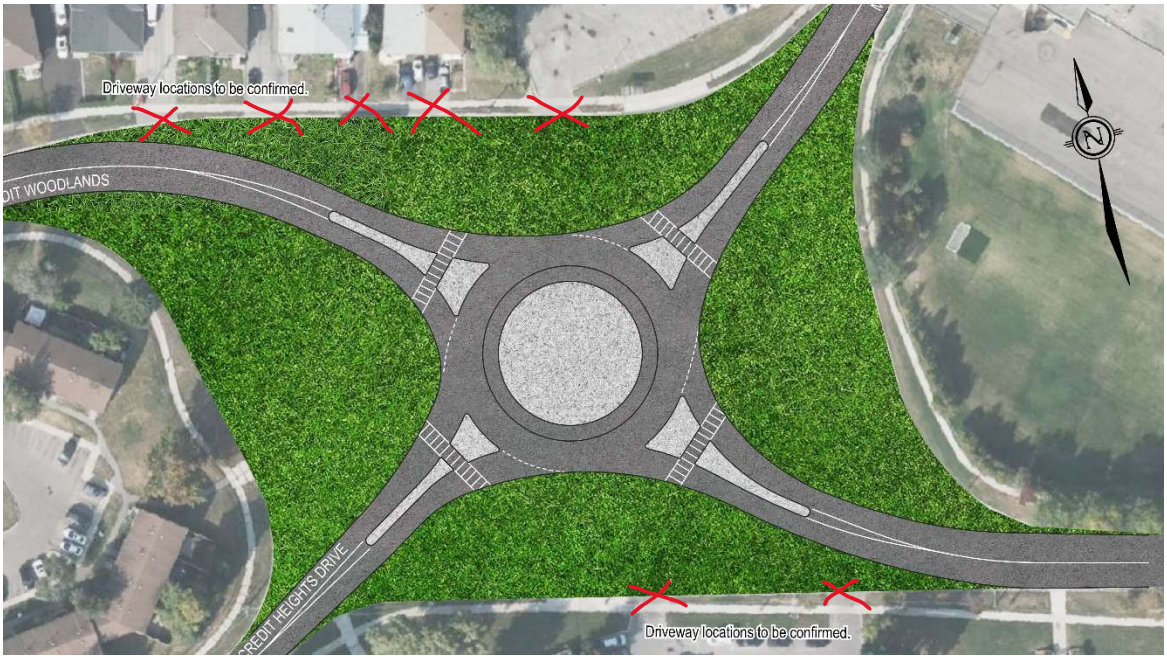

Figure 2 – Concept sketch of central roundabout (potential property access impacts marked with an "X")

The original layout allows for multiple driveways to directly access the roadway. A roundabout configuration following recent guidelines (i.e., TAC Canadian Roundabout Design Guide and FHWA Roundabouts Informational Guide) would not support any driveway accesses within the roundabout. The practice in place when the original configuration was constructed, does not align with these guidelines which have been established to improve safety.

3. Safety Considerations

i. Insufficient Sightlines

With the original configuration there are a few access driveways within and in close proximity of the rotary that have limited sight lines including:

a. The western access driveway (off McBride Avenue) of St. Gerard Elementary School. This is the school's nearest access driveway to the rotary.

b. The western access driveway (off The Credit Woodlands) of the plaza, located across McBride Avenue from the school. This access driveway is located immediately to the west of the only bus stop within the rotary.

c. The western access driveway (off Credit Heights Drive) of the surface parking lot, located on the south side of the rotary.

d. The southern access driveway (off Credit Heights Drive) of the townhouse complex, located on the west side of the rotary.

ii. Vehicle Wrong Way Entry onto the Rotary

With the original configuration, an unfamiliar driver may proceed to exit the plaza or the surface parking lot (noted above in items 3.i.b and 3.i.c) and enter the rotary travelling in the wrong direction.

iii. Pedestrian Access to Transit Stops

With the original rotary configuration, there are no conveniently located controlled pedestrian crossing facilities for transit users to access the transit stops located within and on the north side of the rotary, the two bus stops at the intersection of Erinmore Drive and The Credit Woodlands, or the bus stop located at the intersection of McBride Avenue and Fellmore Drive.

iv. Merge Areas of the Rotary

From a "Human Factors"[9] perspective, the relatively wide pavement (which could physically accommodate two lanes of traffic) at the merge point at all four quadrants of the rotary does not provide drivers with necessary visual cues needed to yield the right of way.

In addition, the yield conditions of the rotary were not consistent, with the original configuration requiring entering vehicles to yield in the northeast and southwest quadrants while circulating vehicles were required to yield in the northwest and southeast quadrants. As noted earlier in this memo, the yield conditions were eventually revised to be consistent in all quadrants so that all entering vehicles were required to yield. The City identified concerns with improper lane changes and failure to yield, along with anecdotal reports of motorists' confusion with navigating the rotary despite the provision of signs and pavement markings. Inconsistent traffic operations and changes to intersection control can both result in driver confusion.

v. Pedestrian and Cyclist Safety

There were no controlled crossing facilities for pedestrians and cyclists in the original rotary configuration. For instance, there are no provisions for a pedestrian, cyclist, or someone with a personal mobility device to travel from the south-west corner (Credit Heights Drive) to the north-east corner (McBride Avenue) without sharing the space with motorized vehicles. This is the same for those travelling from the south-east corner to the north-west corner of The Credit Woodlands.

4. Conclusions and Recommendations

Based on this assessment, restoring the one-way rotary configuration that surrounded Bert Fleming Park is not recommended. The primary concerns with the rotary are related to safety, such is lack of controlled crossings for all road users. It is an older design that does not meet current design standards and guidelines, resulting in higher potential for speeding through the rotary along with driver confusion (i.e., higher potential for travelling the wrong way). In addition, the rotary does not follow City planning and policy guidance which is intended to improve safety and operational standards for all road users, not specifically for autos.

It is recommended that alternative configurations to permanently replace the rotary be explored following the conclusion of the Sharing Lanes pilot project.

[9] In this case, "Human Factors" refers to consideration for how people travelling within this area would act considering multiple factors such as visual cues, familiarity with conditions, consistency with other experiences, etc.